

### **REMARKS**

The Official Action mailed August 1, 2006, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statements filed on March 25, 2004; and July 7, 2006.

Claims 7-18 and 25-52 are pending in the present application, of which claims 7, 10, 13, 16, 33, 36, 39 and 42 are independent. Claims 7, 10, 13, 16, 33, 36, 39 and 42 have been amended to better recite the features of the present invention. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

The Official Action rejects claims 7-18 and 25-52 under 35 U.S.C. § 112, first paragraph, asserting that the recitation of not greater than  $5 \times 10^{14}$  atoms/cm<sup>2</sup> is not supported by the specification. As noted in the Official Action, page 5, lines 19-21 of the present specification discloses an impurity concentration of  $5 \times 10^{12}$  to  $5 \times 10^{14}$  atoms/cm<sup>2</sup>. Claims 7, 10, 13, 16, 33, 36, 39 and 42 have been amended to recite that an active layer of an n-channel or p-channel thin film transistor contains an impurity at a concentration in a range of  $5 \times 10^{12}$  to  $5 \times 10^{14}$  atoms/cm<sup>2</sup>. The Applicant respectfully submits that amended claims 7, 10, 13, 16, 33, 36, 39 and 42 are adequately described and supported in the specification. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 112 are in order and respectfully requested.

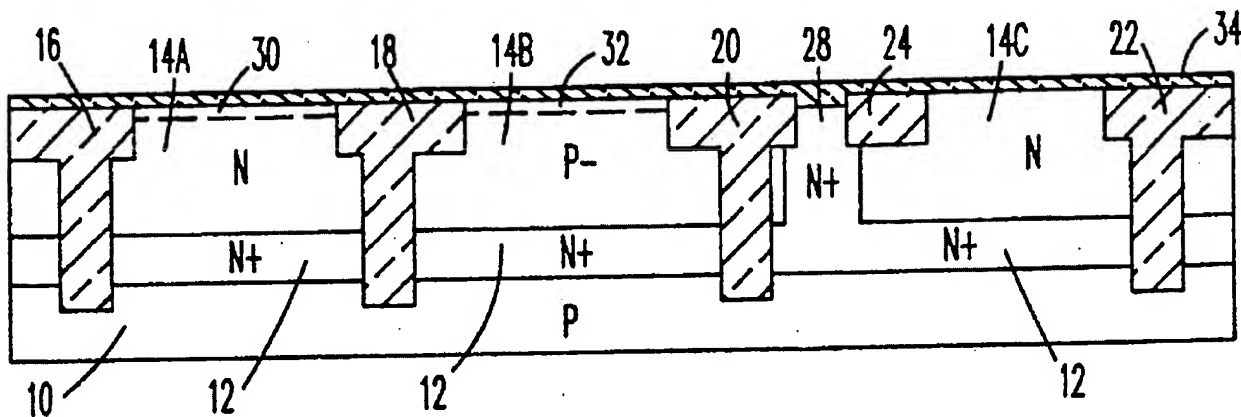
The Official Action rejects claims 7-18 and 25-52 as obvious based on the combination of U.S. Patent No. 6,057,183 to Koyama, U.S. Patent No. 6,127,857 to Ogawa and U.S. Patent No. 5,015,594 to Chu, either alone or in combination with one or more of U.S. Patent No. 5,949,271 to Fujikura, U.S. Patent No. 6,087,245 to Yamazaki and U.S. Patent Application No. 6,077,758 to Zhang. (Although the Official Action refers to 6,087,758 to Yamazaki, the '758 patent is by Hino and is directed to a

"Piezoelectric vibration device." As such, it appears that the Official Action intends to refer to U.S. Patent No. 6,087,245 to Yamazaki, which was cited on Form PTO-892 in Paper No. 1205.) The Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present application, as amended.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. Independent claims 7, 10, 13, 16, 33, 36, 39 and 42 have been amended to recite that an active layer of an n-channel or p-channel thin film transistor contains an impurity at a concentration in a range of  $5 \times 10^{12}$  to  $5 \times 10^{14}$  atoms/cm<sup>2</sup>. For the reasons provided below, Koyama '183, Ogawa, Chu, Fujikura, Yamazaki and Zhang, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

The Official Action implicitly concedes that Koyama '183 and Ogawa do not teach or suggest an impurity concentration not greater than  $5 \times 10^{14}$  atoms/cm<sup>2</sup>. The Official Action relies on Chu to teach "channel implant to obtain the desired threshold voltage for depletion device, including for N channel and P channel using dosage of  $1-10 \times 10^{12}/\text{cm}^2$ " (page 3, Paper No. 20060722). However, in Chu, the concentration of " $1-10 \times 10^{12}/\text{cm}^2$ " refers to the formation of region 30, which is a part of N well 14A. Chu does not specify the concentration of an impurity in an active layer (referred to as a well in Chu). Rather, regarding a p-channel transistor, Chu merely appears to teach that "boron or phosphorous ions, or both, are selectively implanted shallowly into the surface of the well [N well 14A] to form a region 30 with a dosage in the range of about  $1-10 \times 10^{12}/\text{cm}^2$ " (column 4, lines 20-24; Figure 5, reproduced below).



However, the well 14A already contains an n-type impurity (phosphorous) before region 30 is formed (see column 3, lines 28-35). Similarly, regarding an n-channel transistor, Chu appears to teach that "boron ions are selectively implanted shallowly into the surface of the well [P well 14B] to a dosage in the range of about  $1-5 \times 10^{12}/\text{cm}^2$ " (column 4, lines 24-28). However, the well 14B already contains a p-type impurity (see column 3, lines 28-35). Further, unlike Chu, in the present invention, a p-type impurity (boron) is not used to form an n-channel thin film transistor.

Chu simply does not teach or suggest that an active layer of an n-channel or p-channel thin film transistor contains an impurity at a concentration in a range of  $5 \times 10^{12}$


to  $5 \times 10^{14}$  atoms/cm<sup>2</sup>. As such, the alleged combination of Koyama '183, Ogawa and Chu does not teach or suggest the above-referenced features.

Fujikura, Yamazaki and Zhang do not cure the deficiencies in Koyama '183, Ogawa and Chu. Fujikura is relied upon to allegedly teach a shift register circuit or a buffer circuit including a bootstrap circuit including thin film transistors (page 5, Paper No. 20060722), and on Yamazaki or Zhang to allegedly teach a metal for promoting crystallization (page 6, *Id.*). However, Koyama '183, Ogawa, Chu, Fujikura, Yamazaki and Zhang, either alone or in combination, do not teach or suggest that an active layer of an n-channel or p-channel thin film transistor contains an impurity at a concentration in a range of  $5 \times 10^{12}$  to  $5 \times 10^{14}$  atoms/cm<sup>2</sup>.

Since Koyama '183, Ogawa, Chu, Fujikura, Yamazaki and Zhang do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

  
\_\_\_\_\_  
Eric J. Robinson  
Reg. No. 38,285

Robinson Intellectual Property Law Office, P.C.  
PMB 955  
21010 Southbank Street  
Potomac Falls, Virginia 20165  
(571) 434-6789